

REMARK

Applicant respectfully requests reconsideration of this application as amended. Claims 1 and 5-19 and 23-34 remain in the application. No claims have been amended or canceled.

Rejections under 35 U.S.C. § 103(a)

Applicant's claims 1, 5-19 and 23-34 have been rejected under 103(a) as being obvious over Rao, US Patent No. 6,850,531 in view of Ortega, et al, US Patent No. 6,711,162. Applicant does not admit that Rao or Ortega is prior art and reserves the right to swear behind either reference at a later date. Nonetheless, Applicant respectfully submits that the combination does not disclose each and every element of the invention as claimed in claims 1, 5-14, 19 and 23-32.

Rao discloses a multi-service network switch incorporating a distributed forwarding architecture where each forwarding module is capable of independent packet forwarding decisions (Rao, Col. 2, lines 8-16). The forwarding modules support a variety of protocols, such as Internet Protocol (IP), Asynchronous Transfer Mode (ATM), Ethernet, Point-to-Point Protocol (PPP), PPP over Ethernet (PPPoE), etc. (Rao, Col. 24, lines 34-39). A port on a forwarding module can handle different protocols by dynamically binding one protocol to a port when a connection is made. (Rao, Col. 25, lines 4-9). The port is bound to the protocol for the duration of the connection. (Rao, Col. 25, lines 9-10). For instance, a single physical port may support L2TP for one connection session and L2F for another session. (Rao, Col. 24, lines 40-42). Each forwarding module uses a generic forwarding interface (GFI) to send and receive packets in a generic format. GFI handles packet forwarding by dividing the switch into drivers and applications (Rao, Col. 26, lines 58-60). GFI invokes an application to process a packet and uses a driver to forward the packet to the appropriate physical port (Rao, Col. 27, lines 2-5). For example, Rao's application can be either a PPP or IP forwarder that decides whether to forward or drop an appropriate packet (e.g., processing a PPP packet with the PPP forwarder or processing an IP packet with an IP forwarder) (Rao, Col. 27, lines 11-14).

Ortega discloses an ADSL modem that acts as a proxy for service endpoints in a data network (Ortega, Abstract). The ADSL can proxy for different types of data connections in different configurations. In one configuration, the ADSL modem proxies a PPPoE session for a home network device with a remote access server (Ortega, Fig. 2, RAS #50A; Col. 7, lines 31-36). In this configuration, the ADSL modem performs PPPoE encapsulation or PPPoE

decapsulation, depending on the direction of traffic (Ortega, Figure 7, step 5B, col. 18, lines 60-67). In another configuration, the ADSL modem is configured to communicate with the remote access server via a point-to-point (PPP) protocol (Ortega, Fig. 2, RAS #50B; Col. 7, lines 31-36). In yet another configuration, the ADSL modem communicates with the remote access server via a bridged request for comment (RFC) 1483 protocol (Ortega, Fig. 2, RAS #50C; Col. 7, lines 31-36). In the RFC-1483 configuration, the ADSL modem performs RFC-1483 encapsulation or decapsulation. (Ortega, Figure 7, step 5B, col. 18, lines 60-67). Nonetheless, Ortega does not teach or suggest the ADSL modem being able to concurrently handle different protocol streams on the ADSL port at the same time.

Applicant respectfully submits that the combination of Rao and Ortega does not teach or suggest Applicant's claims. In particular, Rao and Ortega disclose only processing one protocol at a time on a port during a given connection and forwarding packets received on that port using the matching one of either a PPP or IP forwarding application (but not both). At best, Rao could have two ports, one receiving IP packets on IPoE and one receiving IP packets on PPPoE, where the packets from both ports are provided to the GFI which provides IPoE packets to a IP forwarder application and PPPoE packets to a PPP forwarder application. Furthermore, Ortega discloses an ADSL modem that can be configured to receive PPPoE packets or RFC-1483 encapsulated packets, but not to concurrently receive streams of RFC-1483 and PPPoE packets at the same time. Being able to only one such protocol at a time at a given port is not what is claimed and will not allow, for example, and not by way of limitation, uses discussed at page 4, lines 2 – 14 and page 8, line 4 – page 11, line 14. Thus, while the invention is not limited to the uses discussed on these pages, it should be understood that Rao and/or Ortega do not enable these uses and the limitations quoted below do.

In contrast, Applicant independent claims 1, 5, 10, 15, 19, 23, 28 and 33 are directed towards receiving streams of both IP packets with IP over Ethernet on a real circuit and IP packets with IP over PPPoE encapsulation on a virtual circuit, with the virtual circuit being within the real circuit; deencapsulating the IP packets from whichever of the IP over Ethernet and IP over PPPoE encapsulation they arrived in; and forwarding the deencapsulated IP packets based on their IP address. For example, claims 1 and 19 require "concurrently receiving a number of streams of Internet Protocol (IP) packets from a physical medium on which is currently configured a real circuit and a number of virtual circuits, wherein the number of virtual circuits are within the real circuit such that the number of Internet Protocol (IP) packets on the

real circuit have an IP over Ethernet encapsulation and the number of Internet Protocol (IP) packets on the number of virtual circuits have a Point-to-Point Protocol over Ethernet encapsulation; deencapsulating the number of Internet Protocol (IP) packets having the IP over Ethernet encapsulation; deencapsulating the number of Internet Protocol (IP) packets having the Point-to-Point Protocol over Ethernet encapsulation; and forwarding the number of Internet Protocol (IP) packets having the IP over Ethernet encapsulation and the Point-to-Point Protocol over Ethernet encapsulation based on an address stored in the number of Internet Protocol (IP) packets".

As another example, claims 5 and 23 require "receiving a number of Internet Protocol (IP) packets over Ethernet on a real circuit from a physical medium on which is currently configured the real circuit and at least one virtual circuit ... removing the Ethernet header from the number of IP packets; receiving a number of IP packets within a Point-to-Point Protocol (PPP) over Ethernet on at least one virtual circuit concurrently with the receiving the IP packets over Ethernet ... removing the PPP header and the PPPoE header from the number of IP packets within the PPP over Ethernet; removing the Ethernet header from the number of IP packets within the PPP over Ethernet; and forwarding the number of IP packets over Ethernet and the number of IP packets within PPP over Ethernet based on the IP address".

Furthermore, claim 10 and 28 require "concurrently receiving a number of different streams of data packets over Ethernet from a physical medium on which is currently configured both a real circuit and a number of virtual circuits running within the real circuit ... upon determining that a received data packet is an Internet Protocol (IP) packet over Ethernet on the real circuit, removing an Ethernet header from the received data packet and forwarding the IP packet based on an IP address stored in the IP packet; and upon determining that a received data packet is an IP packet within a Point-to-Point Protocol (PPP) over Ethernet on one of the number of virtual circuits, removing an Ethernet header, a PPP header and a PPP over Ethernet (PPPoE) header from the data packet and forwarding the IP packet based on an IP address stored in the IP packet".

In addition, claim 15, requires "a number of input/output (I/O) cards coupled to a number of real circuits, wherein each of the number of real circuits include at least one virtual circuit, the number of I/O cards to receive a number of streams of Internet Protocol (IP) packets over Ethernet having an IP over Ethernet encapsulation on the real circuit on a physical medium on which is currently configured the real circuit and at the least one virtual circuit, to receive a

number of IP packets within a Point-to-Point Protocol (PPP) over Ethernet encapsulation on the at least one virtual circuit concurrently with the receiving the IP packets over Ethernet, to deencapsulate the number of Internet Protocol (IP) packets having the IP over Ethernet encapsulation and to deencapsulate the number of Internet Protocol (IP) packets having the Point-to-Point Protocol over Ethernet encapsulation; and a forwarding card having an IP address table, the forwarding card to receive the number of IP packets from the number of I/O cards and to forward the IP packets based on the IP address stored in the IP packet and the IP address table.”

In addition, claim 33, requires “a network element coupled to the physical transmission line configured to, concurrently receive a number of streams of Internet Protocol (IP) packets from a physical medium on which is currently configured a real circuit and a number of virtual circuits, wherein the real circuit is within the physical transmission line, the number of virtual circuits are within the real circuit such that the number of Internet Protocol (IP) packets on the real circuit have an IP over Ethernet encapsulation, and the number of Internet Protocol (IP) packets on the number of virtual circuits have a Point-to-Point Protocol over Ethernet encapsulation ...”.

For at least these reasons, Applicant respectfully submits that independent claims 1, 5, 10, 15, 19, 23, 28, and 33 are allowable. Furthermore, Applicant respectfully submits that claims 6-9, 11-14, 16-18, 24-27, 29-32, and 34 are allowable for at least the reason that they are dependent on an allowable independent claim.

Conclusion

Applicant respectfully submits that the rejections have been overcome by the amendments and remarks, and that the Claims as amended are now in condition for allowance. Accordingly, Applicant respectfully requests the rejections be withdrawn and the Claims as amended be allowed.

Invitation for a telephone interview

The Examiner is invited to call the undersigned at 408-720-8300 if there remains any issue with allowance of this case.

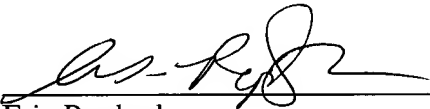
Charge our Deposit Account

Please charge any shortage to our Deposit Account No. 02-2666.

Respectfully submitted,

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